

**Bioanalytical Chemistry –CHEM 384**  
**Interim 2009**

*M-F 10:40–12:40 – RNS 435*

*Lab Hours: To Be Arranged*

*Instructor: Dr. Douglas Beussman*

*Office: RNS 436 - Phone: 786-3429*

*Email: beussmad@stolaf.edu*

**Objectives:** This course will introduce the fundamentals of bioanalytical chemistry. Current clinical applications and examples of biological problems will be used to supplement lecture material. Topics will include biological mass spectrometry, radiochemical analysis, chromatography, electrophoresis, electrochemical analysis and proteomics. Laboratory work will be a required component of this course.

**Course web page:** The URL for the CHEM 384 web page is:

<http://www.stolaf.edu/people/beussmad/Chem384/>

The web page will contain information about the course, a copy of the syllabus, class handouts, and announcements.

**Grading:** Grades will be assigned based on a straight scale from the results of problem sets, lab work, two regular exams, and one comprehensive final exam.

Midterm Exam	100 points
Problem Sets	75 points total
Final Exam	150 points
Lab Work	<u>75 points</u>
TOTAL	450 points

**Grades**

>90%	A	(A+/A/A-)
>80%	B	(B+/B/B-)
>70%	C	(C+/C/C-)
>60%	D	(D+/D/D-)

**Problem Sets:** Problem sets will be given throughout the term. Homework should be turned in during class, but will be accepted until 5:00 PM in RNS 436. ***Problem Sets turned in after 5:00 PM the day it is due will not be graded, unless previous arrangements have been made with the instructor.*** Students are encouraged to work on the problems as a group, but each student must turn in their own work. Handing in photocopied or hand-copied answers constitutes academic dishonesty.

**Exams:** The midterm exam will be an individual, closed book, closed note self-scheduling take-home exam. This self-scheduling exam will be handed out in a sealed envelope. Students will be allowed to decide when and where they wish to take the exam,

but the exam must be completed in a single block of time. After the time limit is up, students will sign the pledge (or not) and return the exam to the envelope. No make-up exams will be given unless prior arrangements have been made with the instructor. Unless otherwise announced, calculators will be allowed, however, the use of programmable calculators to store information of any sort (definitions, equations, etc.) will constitute academic dishonesty. After graded exams are returned, students will have one week to turn exams in to be regraded. The reason for the regrade must be given in writing. The final exam will consist of a take home portion and an in-class, closed book portion. The final exam is cumulative.

**Textbooks:** *Bioanalytical Chemistry*  
Mikkelsen and Cortón

Supplemental reading handouts may be given throughout the term

Lecture Number	Date	Topic	Reading	Due
1	Jan 5	Intro, Peptide/Protein Structure, Spectroscopy	1-10, 47-53	
2	Jan 6	Chromatography	268-292	
3	Jan 7	Gel Electrophoresis	167-180, 191-210	
4	Jan 8	Isoelectric Focusing, 2D gels	213-224	
5	Jan 9	Capillary Electrophoresis	227-244	
6	Jan 12	Capillary Electrophoresis		PS #1
7	Jan 13	Blotting	180-188	
8	Jan 14	Assays	99-121	PS #2
9	Jan 15	Mass Analyzers, MALDI	295-303	
10	Jan 16	Electrospray	Handout	
		<b>Midterm Exam</b> (handed out 1/16, due 1/19)		
11	Jan 19	Protein Fingerprinting	304-312, handout	Exam #1
12	Jan 20	Peptide Sequencing	312-315, handout	
13	Jan 21	Post Translational Modifications	Handout	PS #3
14	Jan 22	Mass Spec Applications (DNA, Bacteria, etc.)	315-318, handout	
15	Jan 23	Dialysis		
16	Jan 26	Centrifugation	247-265	PS #4
17	Jan 27	Electrochemistry		
18	Jan 28	Surface Plasmon Resonance	Handout	PS #5
19	Jan 29	Review/Applications		
20	Jan 30	<b>Final Exam</b>		Exam #2, Lab reports

Instructor reserves the right to make schedule changes throughout the term as needed.